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Young Investigators Awards

CORONARY PHYSIOLOGICAL ADAPTATIONS DURING PERCUTANEOUS CORONARY INTERVENTION IN THE PRESENCE OF LEFT VENTRICULAR DYSFUNCTION: INSIGHTS FROM CORONARY WAVE INTENSITY ANALYSIS

Special Session
North, Room 120
Sunday, March 10, 2013, 11:00 a.m.-11:15 a.m.

Session Title: Young Investigator Awards Competition: Physiology, Pharmacology and Pathology
Abstract Category: Physiology, Pharmacology, Pathology
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Introduction: Left ventricular (LV) dysfunction is often seen in acute coronary syndromes (ACS) and high-risk percutaneous coronary intervention (PCI). Wave intensity analysis (WIA) quantifies energy flux within the circulation. We used WIA to examine the hemodynamic perturbations following ACS and PCI with adjunctive intra-aortic balloon pump (IABP).

Methods: Patients with NSTEMI, or scheduled PCI with >2 vessel disease and LVEF <40% had simultaneous intra-coronary pressure-Doppler assessment. In the ACS group the target vessel (TV) and a remote reference vessel were assessed with LV function and late-gadolinium enhancement (LGE) assessed by cardiac MRI, pre- and 3-months post-PCI. In the PCI+IABP group, TV was assessed during unassisted and 40cc-IABP-assisted settings.

Results: 33 patients were recruited, 22 NSTEMI (LVEF 56±11% and LGE mass 8.4±6.0%) and 11 PCI+IABP (LVEF 34±7%). TV BEW inversely correlated to LGE (r =-0.81, p<0.0001) and predicted regional LV recovery (r = 0.68, p=0.001). By ROC analysis, BEW predicted functional recovery with an accuracy of 88%. IABP resulted in a 12.7% (p=0.04) and 28% (p<0.001) increase in diastolic pressure, and flow velocity (DFV) respectively. A WIA derived early-diastolic wave, corresponding with IABP inflation, was proportional to DFV (r=0.72, p=0.001).

Conclusion: BEW correlates with magnitude and location of infarction, and may predict functional recovery following ACS. WIA uniquely assesses the physiological efficacy of mechanical assist devices.